2 PhD positions in the Marie Skłodowska -Curie Action Doctoral Network (MSCA-DN)

INSIDE:INSIGHT

"The integration of technology with medical and healthcare education - a leadership program"

Offer Description

Call for application for 2 Doctoral (PhD) Training Position available at INSIDE:INSIGHT Consortium, a MSCA Doctoral Network funded by the Horizon Europe programme of the EU. It is composed of 12 partners across Europe, Canada and New-Zealand and includes leading scientists from academia and industry. Within the consortium there is expertise in educational theories and technologies, human anatomy, computer vision and sciences, biomedical engineering, medical imaging and surgery. Through its research and training activities, the INSIDE:INSIGHT project will contribute to scientific advancement and innovation in Europe, ultimately leading to societal and economic benefits. See project details, eligibility requirements and application process below.

The graduates of **INSIDE:INSIGHT** will be well-prepared for a career in- as well as outside academia with an innovative and beyond state-of-the-art view on different aspects of educational technologies. Moreover, the students will be trained in transferable skills, such as communication, entrepreneurship, intellectual property rights and ethics. Participating in INSIDE:INSIGHT offers many unique opportunities, including:

- A project as Marie Skłodowska Curie trainee in one of the participating institutions with the objective of receiving a doctoral degree (PhD).
- State-of-the art, exciting research in an international consortium with highly integrated projects.
- Expert training in basic and applied research, along with a thorough understanding of entrepreneurship and valorisation.
- A research training period in another consortium member's lab lasting from a few weeks up to three months, performed in a different country.
- Gross Salary according to [EU guidelines](#) for Marie Skłodowska Curie trainees, including mobility payments and family allowances where applicable.

Hosting Institutions - see details below

DC5 vacancy - [University of Minho](#), located in Braga, Portugal, is a leading institution known for its innovation-driven research and dynamic academic environment. UMINHO is offering a full-time (100%) and fully funded PhD position for a project in *gamification of teaching in medical and healthcare education with AI and serious games*.

DC8 vacancy - [apoQlar](#) GmbH, located in Hamburg, Germany, is the developer of a medical mixed reality platform that is revolutionizing how medicine is practiced, experienced, learned, and shared. HoloMedicine® is a software platform that leverages to transform medical images, clinical workflows, and medical education into an interactive 3D mixed reality environment. apoQlar is looking for a full-time (100%) doctoral scholarship holder in the development and assessment of XR technologies in (bio)medical education. You will work hand in hand with apoqlar's R&D Team to support the subject *SurgiLearnX: Revolutionizing surgical training with XR-enhanced MOOC platform*.

PROJECT DETAILS

DC5: Gamification of teaching in medical and healthcare education with AI and serious games
Hosting Institution: University of Minho (UMINHO), Portugal
Supervisor: Prof Dr. V. Alves
Location: Braga
Email address for the applications: valves@di.uminho.pt
Applications Deadline: 14 July 2025
Subject area: Biomedical Engineering; Artificial Intelligence
Project-specific selection criteria: The ideal candidate should have a Master's degree or similar education level in Biomedical Engineering and/or Artificial Intelligence with demonstrated expertise in AI/ML, computer vision, and medical image processing. Additionally, practical experience in medical image processing, serious games development, gamification, and educational technologies is highly desirable. Candidates should be familiar with basic research techniques (e.g., programming, graphics processing, audio processing), gamification principles, game design, educational technology, project management, user testing and assessment.

DC8: SurgiLearnX: Revolutionizing surgical training with XR-enhanced MOOC platform
Hosting Institutions: University Hospital Essen (UKE) and the company Apoqlar (APQ), Germany
Supervisor: Dr. Daniela Salzmann
Location: Hamburg, Germany
Link for the applications: https://apoqlar.bamboohr.com/careers/102
Applications Deadline: 14 July 2025
Subject area: XR-enhanced MOOC Platform development
Project-specific selection criteria: Candidates should have a Master's degree or similar education level in biomedical engineering, technical medicine, computer science or a related discipline, with a strong interest or proven experience in XR technologies (VR, AR, MR) and their application in education or healthcare. Candidates should have experience in C#, Unity or Unreal Engine, with a background in XR application development. Proficiency in UX design, user testing, and both qualitative and quantitative research is essential. Familiarity with cloud services, SQL/NoSQL databases, and MOOC infrastructure is highly desirable. Skills in React, Node.js, AWS, or Azure are advantageous. Strong research abilities and analytical skills for academic work are required.

APPLICATION AND RECRUITMENT PROCESS

Skills, Qualifications and Project-specific Requirements

Project-specific criteria are detailed below.

Benefits

- INSIDE:INSIGHT Doctoral Candidates will be employed according to the rules for Doctoral Candidates in MSCA-DNs and the general regulations of each host institution.

- The financial package will include the monthly researcher allowances subdivided into 1) a living allowance of €3,400 (adjusted according to the relevant country correction coefficient), 2) a mobility allowance of €600, and 3) a family allowance of €660, if applicable. Employer costs and other deductions depend on recruiting host.

- Doctoral Candidates will be given an EU-funded employment contract for 36 months by their host institution and will be entitled to full employee benefits and inclusion in social security schemes of the host country.

Eligibility criteria

Experience eligibility requirement

Eligible candidates must:

· Hold a Master's degree or equivalent in a field of science relevant to their chosen project - or you will have obtained it by the time you **start work as of August 1st, 2025 at the latest.**

· You can demonstrate excellent study results, and you have great team-work attitude and communication skills.

· Your research qualities are in line with the faculty and university research policies.

· You are fluent in academic English (speaking and writing).

· You are eligible to work in the European Union.

· You act with attention to quality, integrity, creativity and cooperation.

Mobility eligibility requirement

The fellow must not have resided in the country where the research training activities will take place, for more than 12 months in the 3 years immediately prior to the recruitment date (and not have carried out their main activity - work, studies, etc. - in that country).

Selection process

The selection procedure will be open, transparent and merit-based, fully aligned with the Code of Conduct for the Recruitment of Researchers. Although the selection will be based on the quality of applications, gender balance will also be considered. Applications (in English) must include:

1) A **motivation letter,** emphasizing the candidate's strength regarding the project and the requirements;
2) A **complete CV** (max 2 pages);
3) A **1-page summary of your Master thesis**
4) A transcript of your study results with scanned copy of your Bachelor's and Master's Degree certificates. In case the Master's Degree has not been obtained yet at the closing date for application, the candidate has to submit a declaration signed by their supervisor or University official stating that the degree will be obtained by the time of PhD enrolment;
5) **Two reference letters** or the names and contact details of two Referees (former Supervisors/PIs).

Application documents in a single pdf file (< 3 MB) should be sent through the recruitment email address provided. The subject line of the email must be in the following format: *"INSIDE:INSIGHT application for Project_DC nX".*

<u>**Application deadline is officially 14 July 2025**</u>

Applicants are advised to familiarise themselves thoroughly with the INSIDE:INSIGHT project for which they apply and be ready to answer questions on the chosen topic. INSIDE:INSIGHT will select a Doctoral Candidate through a 2-step recruitment process. The INSIDE INSIGHT Consortium evaluation committee reviews all applications as soon as possible after the application deadline. As soon as a decision is made, we will notify you. If you are still eligible after the pre-selection, you will be informed about the possible next step(s) in the selection procedure, including online interviews (exact date will be discussed upon availability). For any specific questions about the profile and description of duties, please contact the Supervisors directly.

DC	Project Title	Primary Supervisor Contact	Institution	EU State
5	Gamification of teaching in medical and healthcare education with AI and serious games	Prof. Victor Alves valves@di.uminho.pt	University of Minho (UMINHO)	PT
8	SurgiLearnX: Revolutionizing surgical training with XR-enhanced MOOC platform.	Dr. D. Salzmann daniela.salzmann@apoqlar.com Prof. Dr. J. Egger jan.egger@uni-due.de Applications email address https://apoqlar.bamboohr.com/careers/102	Apoqlar (APQ) University Hospital Essen (UKE)	DE

Detailed Project Description

DC5	Gamification of teaching in medical and healthcare education with AI and serious games
Host Institution	Universidade do Minho (UMINHO)
Doctoral School	Universidade do Minho
Primary Supervisor	Prof. Dr. Vítor Manuel Rodrigues Alves
Email address for applications	valves@di.uminho.pt
Internal Deadline	14 July 2025
Planned duration	36 months + 12 months (UMINHO)* * The Biomedical Engineering PhD program at UMINHO requires a minimum of 48 months
Subject Area	Biomedical Engineering; Artificial Intelligence

Introduction:
This project aims to explore the integration of gamification, artificial intelligence (AI), and serious games in medical and healthcare education to enhance student engagement, motivation, and knowledge retention. It will contribute to the existing knowledge while evaluating AI's role in tailoring educational content and providing real-time feedback. The project also seeks to identify challenges in implementing these technologies and propose solutions. Expected outcomes include improved educational practices, positive student experiences, and increased adoption of AI-driven gamification by institutions.

Objectives:

Science objectives: 1) To contribute to the existing body of knowledge on gamification, AI and serious games in medical and healthcare education, and offer insights that can benefit developers, educators, institutions, and learners (students, health professionals). 2) To determine whether the integration of gamification elements based on AI, including serious games, in medical and healthcare education enhances student engagement, motivation and knowledge retention. 3) To examine the role of AI in tailoring educational content, adapting to individual learner needs, and providing real-time feedback to improve the learning experience. 4) To identify the challenges and limitations in the implementation of these technologies and strategies and propose solutions to overcome them.

Training objectives: 1) Effective Assessment and Feedback: Learn how to use AI tools for real-time assessment and personalized feedback and develop strategies for providing constructive feedback to students. 2) Best Practices and Ethical Considerations: Explore best practices for implementing gamification and technology in a responsible and ethical manner and understand potential ethical challenges and how to address them. 3) Accessibility and Inclusivity: Understand the importance of accessibility and inclusivity in medical education and learn how to design gamified content and serious games that accommodate diverse learning needs.

Expected Results: (R1) increased competence in using gamification and AI technology, successful integration of these elements in medical and healthcare education, improved student engagement and personalization, ethical awareness, and enhanced accessibility and inclusivity; **(R2)** positive student outcomes, including improved performance and satisfaction, greater adoption and integration of these methods by institutions, and participants' ability to create high-quality learning resources. **(R3)** Feedback and satisfaction from participants, coupled with their ongoing commitment to learning, are also expected outcomes, along with a demonstrated ability to monitor and evaluate the impact of gamification in education.

Secondments: 1) 3 months at UBC (M12-14) to contribute to effective design and implementation of the gamified curriculum and serious games; **2)** 3 months at UKE (M18-20) to develop personalized learning algorithms, data analysis, and feedback systems to enhance the AI component.

Enrolment in Doctoral degree(s): Universidade do Minho (UMINHO)

Project-specific selection criteria: Candidates should have a Master's degree or similar education level in Biomedical Engineering and/or Artificial Intelligence. Knowledge of artificial intelligence/machine learning, computer vision, and a proven track record are required. Additionally, practical experience in medical image processing, serious games development will be a plus. The candidate should be familiar with basic techniques (e.g., programming, graphics processing, audio processing). Candidates should be familiar with gamification principles, game design, educational technology, project management, user testing and assessment.

Recommended reading:
- **The fundamentals of Artificial Intelligence in medical education research**: AMEE Guide No. 156. Tolsgaard MG, Pusic MV, Sebok-Syer SS, Gin B, Svendsen MB, Syer MD, Brydges R, Cuddy MM, Boscardin CK. Med Teach. 2023 Jun;45(6):565-573. doi: 10.1080/0142159X.2023.2180340
- **Gamification in medical education: identifying and prioritizing key elements through Delphi method.** Wang, Y. F., Hsu, Y. F., Fang, K. T., & Kuo, L. T. *Medical Education Online*, *29*(1). (2024). https://doi.org/10.1080/10872981.2024.2302231
- **Game-based learning in medical education**. Xu, M., Luo, Y., Zhang, Y., Xia, R., Qian, H., & Zou, X. *Frontiers in Public Health*, *11*, 1113682. (2023). https://doi.org/10.3389/FPUBH.2023.1113682/BIBTEX

DC8	SurgiLearnX: Revolutionizing surgical training with XR-enhanced MOOC platform
Host Institution	APOQLAR (APQ)
Doctoral School	University Hospital Essen
Primary Supervisor	Dr Daniela Salzmann
Secondary Supervisors	Prof. Dr. Jan Egger
Applications address	https://apoqlar.bamboohr.com/careers/102

Applications Deadline	14 July 2025
Planned duration	36 months
Subject Area	XR-enhanced MOOC Platform development

Introduction: Our objective is to define and develop a scalable surgical learning MOOC platform that adheres to eLearning design principles and meets the diverse needs of healthcare professionals as well as critical ethical considerations related to XR, AI, visualizations, and data protection. This includes creating structured XR teaching modules that leverage 3D medical objects, digital twins, and interactive case studies, while also evaluating the effectiveness of XR environments compared to conventional training methods. As a key contributor, you will gain hands-on experience in a Software-as-a-Service (SaaS) lifecycle, work collaboratively across disciplines, and explore market access strategies for XR technologies in healthcare education.

Objectives:

Science objectives: 1) To define the requirements of an open scalable surgical learning MOOC platform in XR for health professionals based on eLearning design principles and specific needs of the healthcare workers (e.g., adaptability to diverse student and instructor profiles, platform compatibility, collaboration, certification including legal and professional regulations compatibility, user management, scalable deployment, sustainable business model). 2) To develop a structured XR teaching module creation (for instructors) and consumption (for trainees) workflow to accommodate specific needs of surgical training (e.g., 3D medical objects, digital twins, case studies, animations, exercises, consultation). 3) To develop a study design to evaluate the effectiveness of medical and healthcare self-learning XR environments over conventional on-site trainings on training time, learning outcomes, retention of knowledge.

Training objectives: 1) Software-as-a-Service lifecycle (SaaS): Provide DCs with hands-on SaaS product experience, from ideation to market entry. 2) XR technology: Build proficiency in the development and design of XR applications that seamlessly work across multiple platforms and online services along with massive user and data management. 3) Interdisciplinary collaboration: Get familiar working effectively with experts from various fields to find solutions to complex problems. 4) Market access: Learn about research valorisation techniques and strategies for product marketing in the healthcare and XR technology sector.

Expected Results: The project anticipates the creation of a highly adaptable and scalable XR surgical learning platform catering to health professionals, promoting efficient training and skill development. It envisions the development of specialized surgical teaching modules enriched with immersive technologies and evaluations of their effectiveness in enhancing learning outcomes. Through interdisciplinary collaboration and market access strategies, the project aims to pave the way for innovative XR solutions in healthcare education and broaden access to these valuable training resources.

Secondments: (1) 3 months at UTW (M10-12) to gain insight on MOOC development, online learning and simulation training. **(2)** 3 months at TUG (M19-21) to enhance software skills for cross compatible XR platform and framework development. **(3)** 4 months at UGENT (M30-33) to conduct user tests for self-regulated learning techniques and refinement of the proposed solution.

Project-specific selection criteria: Candidates should have a Master's degree or similar education level in biomedical engineering, technical medicine, computer science or a related discipline, with a strong interest or proven experience in XR technologies (VR, AR, MR) and their application in education or healthcare. They should have programming experience, particularly in C#, Unity, or Unreal Engine, with a background in developing XR applications. Experience in user experience (UX) design, conducting user tests, and refining user interfaces based on feedback is essential, along with a good command of both qualitative and quantitative research methodologies. Familiarity with the infrastructure for hosting MOOC applications—particularly cloud services, databases such as SQL and NoSQL, and user authentication systems—is highly desirable. Additionally, experience with web development frameworks such as React or Node.js, or backend infrastructure like AWS or Azure, would be advantageous. The candidate should also have strong research interests and analytical skills, with the ability to conduct rigorous academic work. The PhD will be enrolled in the doctoral school of the University Hospital Essen.

Recommended reading:
- **Remote proctorship program IHPBA** https://www.linkedin.com/posts/yujiagao-7a2117210_mixedrealityholomedicine-hololens2-activity-6993753622803091458-GjL9?utm_source=share&utm_medium=member_desktop 3)
- **Use of the mixed reality tool "VSI Patient Education" for more comprehensible and imaginable patient educations before epilepsy surgery and stereotactic implantation of DBS or stereo-EEG electrodes.** House, P.M., Pelzl, S., Furrer, S., Lanz, M., Simova, O., Voges, B., Stodieck, S.R.G., Brückner, K.E. Epilepsy Res. 2020 Jan;159:106247. Epub 2019 Nov 26. PMID: 31794952.

- **Systems, Methods and Apparatus for Calculating Position and Rotation from a Manually set Reference Point in a Spatial Mesh**. Patent no: US2022392163A1 (05/2023)
- I**mage Registration with Semantic Segmentation Mask. Ensure results for 3D Visualisation**.Patent no: 19196193.7 (09/2019)